

Application No. 10/666974
Amendment dated January 17, 2006

Docket No.: 0111554.00128US6

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

48. (Currently Amended) A multi-cavity thin-film interference filter comprising a sequence of alternating layers of amorphous silicon and a dielectric material deposited one on top of the other to form a tunable bandpass filter, said dielectric material being selected from the group consisting of silicon dioxide and silicon nitride, said sequence of alternating layers forming coupled Fabry-Perot cavity structures including at least a first Fabry-Perot cavity structure and a second Fabry-Perot cavity structure, each of said first and second Fabry-Perot cavity structures comprising:

a first multi-layer thin film interference structure forming a first mirror;

a thin-film spacer layer deposited on a top surface of the first multi-layer thin-film interference structure, said thin-film spacer layer made of said amorphous silicon; and

a second multi-layer thin film interference structure deposited on a top surface of the thin-film spacer layer and forming a second mirror; and

wherein said multi-cavity filter further comprises:

a layer of electrically conductive material to which, during use, power is supplied by an external source to change the temperature of the multi-cavity thin film interference filter and thereby shift the passband of the multi-cavity thin film interference filter; and

a substrate on which the first multi-layer thin film interference structure of the first Fabry-Perot cavity structure is deposited, wherein said layer of electrically conductive material forms a ring heater on the substrate and circumscribing an optical path through the first and second Fabry-Perot cavity structures.

Claims 49-59 (Canceled)

60. (Previously Presented) The multi-cavity thin film interference filter of claim 48, wherein the dielectric material is silicon nitride.

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Claims 61-62. (Canceled)

63. (Currently Amended) ~~A~~ ~~The multi-cavity thin-film interference filter of claim 48,~~
further-comprising a sequence of alternating layers of amorphous silicon and a dielectric
material deposited one on top of the other to form a tunable bandpass filter, said dielectric
material being selected from the group consisting of silicon dioxide and silicon nitride, said
sequence of alternating layers forming coupled Fabry-Perot cavity structures including at least a
first Fabry-Perot cavity structure and a second Fabry-Perot cavity structure, each of said first and
second Fabry-Perot cavity structures comprising:

a first multi-layer thin film interference structure forming a first mirror;

a thin-film spacer layer deposited on a top surface of the first multi-layer thin-film
interference structure, said thin-film spacer layer made of said amorphous silicon; and

a second multi-layer thin film interference structure deposited on a top surface of the
thin-film spacer layer and forming a second mirror;

wherein said multi-cavity filter further comprises:

a layer of electrically conductive material to which, during use, power is supplied by an
external source to change the temperature of the multi-cavity thin film interference filter and
thereby shift the passband of the multi-cavity thin film interference filter; and

a crystalline semiconductor substrate on which the first multi-layer thin film interference
structure of the first Fabry-Perot cavity structure is deposited, wherein said layer of electrically
conductive material is a doped upper region of said substrate, wherein during use the power that
is supplied to the doped upper region is electrical power.

Claims 64-67. (Canceled)

68. (New) The multi-cavity thin film interference filter of claim 63, wherein the
dielectric material is silicon nitride.